## DETAILED ACTION

### *Status of Application*

Claims 1-27 are pending and presented for examination.

### *Claim Objections*

1. Claims 13-14 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claims 13-14 dependent on Claim 1, require temperature ranges of desorbing ammonia outside the range required by Claim 1. Thus, the claims fail to further limit the subject matter of Claim 1 and are improper.

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Young (US3691099).

Claim 1 is drawn to a catalyst treating method comprising

-mixing a ferrierite or zeolite isostructural to ferrierite in an aqueous solution to form a slurry

-adjusting the pH to 2-7 with no deleterious effect on the catalyst

-heating said slurry to a temperature of 210-575 F

-maintaining slurry at said temperature for less than 24 hours

Wherein catalyst desorbs sorbed ammonia at a temperature about 248F lower than the same untreated catalyst before said method.

Young teaches a method of treating a crystalline zeolitic aluminosilicate having ammonium and Group IA, IB, IIA, IIB, IIIB, VIIB and/or VIII metal cations, comprising contacting said aluminosilicate with an aqueous acid at a pH between 2-6 at a temperature up to 220 F for 0.5-30 hours where the time and temperature are insufficient to destroy the crystallinity of said aluminosilicate (see col.4 lines 58-68 and claim 4). Young teaches specific examples contacted with aqueous HCl solutions at a pH of 3.4, 3.0 and 2.6 and heated at 212 F for 1, 4, and 12 hours (see col.5, lines 38-44). Furthermore, the reference establishes the pH, temperature, and contact time to be result effective variables: “the selection

of these parameters depends upon stability of the original aluminosilicate it is apparent that the optimum conditions of pH, temperature and contact time must necessarily be determined in each particular case in order to accomplish the most desirable results" (col.5, lines 31-35). It would have been obvious to one of ordinary skill in the art at the time the invention was made to choose the instantly claimed ranges through process optimization, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. See *In re Boesch*, 205 USPQ 215. One would have been motivated to do so in order to obtain the best results from the catalyst and maximize industrial applicability of the invention.

Young teaches preferred aluminosilicates to include synthetic and naturally occurring zeolites including ferrierite, mordenite, zeolite Y and others (see col. 6, lines 30-58). It would be obvious to one of ordinary skill in the art to apply the method taught by Young to one of the zeolite species disclosed by Young with a reasonable expectation of success.

Although Young does not specifically disclose the temperature at which the catalyst desorbs sorbed ammonia, this feature would inherently follow the required method. As Young teaches substantially the same treatment method, and ferrierite or an isostructural zeolite to ferrierite, it would follow that this feature would be included as well.

4. Claims 2-17 and 19-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Young (US3691099) as applied to Claim 1 above, in view of Bowes et al. (US4335019).

In regards to claims 2-4, 19-20, and 27, Claim 2 further requires the catalyst to comprise 0.05-2.0 wt% of at least one Group VIII metal. Claims 3 and 4 further require a Group VIII noble metal and platinum, respectively. Independent Claims 19 and 27 are equivalent to Claim 1, but further require a Group VIII metal and 0.05-2.0 wt % of platinum, respectively. Claim 20 is equivalent to Claim 4, but dependent on independent claim 19.

Young teaches said crystalline aluminosilicate comprises Group IA, IB, IIA, IIB, IIIB, VIIB and/or VIII metal cations but does not specifically teach 0.05-2.0 wt% of a Group VIII metal. Bowes et al. (hereafter Bowes) teaches a ferrierite catalyst treated with acid and a heat treatment to impart platinum (see claim 6). Bowes teaches specific examples including ferrierite comprising 0.39 wt% platinum (see example 11). It would have been obvious to one of ordinary skill in the art to modify the process of Young to include a ferrierite comprising platinum (a Group VIII noble metal) as taught by Bowes. One would have been motivated to do so to increase the selectivity of the catalyst by including platinum metal in the ferrierite zeolite (see Bowes col. 7, lines 14-42).

In regards to claim 4, Young teaches said zeolite is contacted with an aqueous solution (see above rejection of Claim 1), and teaches specific examples including slurrying the zeolite in water (e.g. Young Example 1).

In regards to claims 6-8 and 21, Young teaches adjusting solutions to a pH of 2-6, specific examples including pH of 3.3, 3.5 and 4 (see examples 1, 6, and 7) the use of diluted hydrochloric acid (HCl) as an acid to adjust pH (see examples 1-3), and the use of diluted ammonium hydroxide as a base to adjust pH (see example 14).

In regards to claims 9-10 and 22, Young teaches slurry is maintained for 0.5-30 hours (see claims 4,6) and specific examples including maintaining the slurry for 18 hours (see example 1).

In regards to claims 11-12 and 23, the references differ in that they do not disclose the specific temperature ranges required by the instant claims. However, Young establishes the temperature treatment is a result effective variable (see above rejection of claim 1). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to choose the instantly claimed ranges through process optimization, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. See *In re Boesch*, 205 USPQ 215. One would have been motivated to do so in order to obtain the best results from the catalyst and maximize industrial applicability of the invention.

In regards to claims 13-14 and 24, Young does not specifically disclose the temperature at which the catalyst desorbs sorbed ammonia, however, this is an inherent feature the zeolite following said treatment method. As Young

teaches substantially the same treatment method and catalyst zeolite, it would follow that this property would be included as well.

In regards to claim 15 and 25, Young reference teaches the aluminosilicate comprises Group IA, IB, IIA, IIB, IIIB, VIIB and/or VIII metal cations which suggests that the reference teaches a small genus of the claimed species (a Group VII metal). It would be obvious to one of ordinary skill in the art to select VII from the taught genus. One would be motivated to do so in order to achieve a more beneficial catalyst with a reasonable expectation of success.

In regards to claim 16, Young teaches the use of a binder to improve the structural properties of the catalyst, preferably alumina (see col. 10, lines 62-68 to col. 11, lines 1-6).

In regards to claim 17 and 26, Young teaches said treatment can improve the selectivity of the zeolitic aluminosilicate (see col. 21, lines 44-47). Furthermore, the selectivity is an inherent feature of the zeolite following said treatment method. As Young teaches substantially the same treatment method and catalyst zeolite, it would follow that this property would be included as well.

5. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Young (US3691099) in view of Bowes et al. (US4335019) as applied to claims 2-17 above, further in view of Gajda et al. (US5723710).

Claim 18 further requires that said catalyst treatment does not result in dealumination. Young in view of Bowes differs in that the references do not disclose that the method does not result in dealumination. Young teaches a

treatment method which results in abstraction of structural aluminum from said zeolite aluminosilicate but which is insufficient to destroy the crystallinity of said aluminosilicate (see Young col. 4, lines 58-68). Young also teaches the degree of aluminum abstraction is controlled by the length of time the zeolite is in contact with the acid solution and the temperature at which the method is carried out (see Young col. 5, lines 14-30).

Gajda et al. teaches a treatment method comprising contacting an acid solution of pH 0-2 with zeolite beta at temperatures of 20-125 C and that the parameters are optimized to prevent dealumination of the zeolite (see Gajda col. 5, lines 5-20). It would have been obvious to one of ordinary skill in the art to modify the method of Young in view of Bowes to optimize the treatment conditions to prevent dealumination of the zeolite as taught by Gajda. Both Young and Gajda teach dealumination to be a result effective variable, and thus would be considered routine optimization to one of ordinary skill in the art. One would be motivated to make such a modification in order to maximize the effectiveness of the treatment method while preventing dealumination and breakdown of the zeolite structure, thereby increasing the industrial applicability of the method.

### *Conclusion*

All claims have been rejected. No claims have been allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOHN A. HEVEY whose telephone number is (571)270-3594. The examiner can normally be reached on Monday - Friday 7:30 AM to 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Kim can be reached on 571-270-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Vickie Kim/

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